

the iron spectrum, with the exception of a weak one at λ 5276. There is only a trace of this line in the spectra of either the Nova or α Canis Majoris which have been compared. In the spectra of the Nova obtained with lower dispersion, however, a line is distinctly shown in this position, though it is considerably weaker than the four lines previously mentioned.

The absence of the strong lines which are familiar in the arc spectrum and in the ordinary spark spectrum in this region is to be ascribed to higher temperature; experiments which are in progress show that under certain conditions the two lines $\lambda\lambda$ 5018.6 and 5169 are by far the strongest lines in the spectrum of iron between λ 500 and D, while that at λ 4924.1 is distinctly stronger than any of the well-known group of four arc lines in which it falls.

The published wave-lengths of the lines of Nova Aurigæ show that the same lines were present in that star. Further investigations of the spectrum of Nova Aurigæ have strengthened the conclusion that most of the lines, after we pass from those of hydrogen, are enhanced lines of a comparatively small number of metals.

When the inquiry is extended into the regions more refrangible than H β , the evidence in favour of the similarity of the spectra of the two Novæ with that of α Cygni is not so conclusive, because of the greater breadth of the lines (since the spectra have been obtained by the use of prisms) and because of the fact that in this region the enhanced lines of iron frequently occur in groups.

In the region between H δ and H γ , however, there is a well-marked enhanced line of iron at λ 4233.3, and also two doubles at $\lambda\lambda$ 4173.7, 4179.0, and $\lambda\lambda$ 4296.7, 4303.3, and a comparison of α Cygni with Nova Persei indicates that these fall on broad bright bands of the Nova spectrum.

NORMAN LOCKYER.

MR. BORCHGREVINK'S ANTARCTIC EXPEDITION.¹

MR. BORCHGREVINK succeeded in an enterprise of which he may be justly proud. Unknown and without external influence, by the force of his immense ambition and determination, he obtained the support of a man of great wealth, and unaided, if also untrammelled, by Government, learned societies or committees of any kind, he equipped an expedition, selected a scientific staff, spent a winter on land in the Antarctic regions for the first time in history, and made his way to a point nearer the South Pole than had ever been reached before. For doing this he deserves praise and honour. With his motives we have no concern; they appear to have been partly commercial and partly scientific, but in these columns we can only treat the expedition from a purely scientific point of view, forming our opinions from the facts placed before us in the book.

Mr. Borchgrevink chose his ship well, and she proved to be as stout and powerful a steam-whaler as ever put out from Norway. He chose his scientific staff well, and they appear to have worked conscientiously and to have obtained results which cannot fail to advance knowledge if they are properly discussed and published. He chose his sailing master, Captain Jansen, well, and he appears to have conducted the expedition without a hitch or any trace of insubordination. Mr. Borchgrevink was able to repeat in his steamer Sir James Clark Ross's sailing-ship voyage, and saw again Mounts Erebus and Terror; he landed on the southern ice, and advanced a few miles beyond the edge of the previously known world.

The book is short—an excellent thing in accounts of travel; the author has a certain power of observation and

description, as the chapter on the habits of penguins and many little episodes of personal adventure show. His illustrations are remarkably fine, admirable reproductions of good photographs, and they are introduced with a lavish hand.

This is the bright side of the medal; the reverse is not so pleasing. Mr. Borchgrevink would have done better if he had had another chronicler, for his literary style does him less than justice. We can excuse an author, whose forte is action rather than study, for attributing incorrect titles to English men of science, but he might surely be expected to give correctly the names of his own distinguished countrymen, amongst whom Dr. Hjort appears as *Hjorth*, and Dr. Reusch in one place as *Reush* and in another as *Rusch*. Although the book is small we can hardly attribute these slips to anything but haste in correcting the proofs. We wish we could find an equally satisfactory explanation of other errors of a more serious kind.

We fear that Mr. Borchgrevink did not set his ambition high enough, and did not endeavour to make himself acquainted with the elementary principles of the various sciences which the members of his staff were pursuing. During the long Antarctic night he might easily have learned from his skilled assistants more than sufficient to have enabled him to give an intelligible sketch of the work of his expedition, even if time had been wanting at an earlier period. That he did not do so is to be inferred from the following circumstances, to which we call attention with real regret and which we would have passed over gladly were it not that the objects of the expedition have been generally spoken of as scientific.

On p. 63 there is given what purports to be a fully worked example of the calculation of the longitude from observations of the sun taken near Balleny Island,¹ by means of a Cary 10-inch sextant. The index error was found to be "14 in." off the arc—a possible printer's error for 14", one would think; but further down the error is given as 14' 0". However, the sun's semidiameter is also estimated at the excessive value of 16° 17' 1", and this gives us a clue to the system of notation employed for the corrections, though not for the instrumental reading. It is simply to write minutes as degrees, seconds as minutes and decimals of a second as seconds. Working out the calculation on this assumption the final corrected altitude is obtained as stated. On p. 64 the curious blunder of "Lysin Sq.," probably intended for "Log Sin²," and several others equally absurd have escaped the author's vigilance, and the logarithms set down are not what we would expect.

Is this an elaborate joke played by the author on the public, or is it a joke played on the author by some person unknown and not detected by him? We cannot think that it was meant seriously, and we cannot see why the example was ever given, as no one has any interest in disputing the position of Balleny Island. The actual figures and working of the really critical observation which convinced Mr. Borchgrevink that he had got further south than Sir James Ross might have been quoted reasonably enough, but are not. If any credence is to be given to the position of the expedition at any date, the serious question raised by this worked specimen must be answered.

On p. 136 we read, "Only Jupiter and its stars and Centauri were visible." So much for astronomy.

With regard to meteorology the same indifference to figures occurs. In more than one place the height of the barometer is given in the form "29.7.1," although elsewhere the readings are expressed in the usual way. The vaguest references are made to instrumental observations; for instance, a graphic account is given of the difficulty of placing a thermograph at 2000 feet on Cape

¹ "First on the Antarctic Continent; being an account of the British Antarctic Expedition, 1898-1900." By C. E. Borchgrevink, F.R.G.S., Commander of the Expedition. With portraits, maps, and 186 illustrations. Pp. xvi+334. (London: George Newnes, Ltd., 1901.)

¹ Balleny Island is stated, on p. 3, to be a volcano 12,000 feet high; here there is evidently some confusion with Mount Erebus.

Adare, and of returning for it a week later; but its readings are not noted. The "anti-cyclonic theory" is referred to, but neither discussed nor explained.

"Characteristic stratification of the rocks" is referred to on p. 223, and some of the photographs do appear to show lines of bedding; but we are left in doubt as to whether the author realises the great interest of discovering such rocks on the Antarctic continent. In the preliminary report on the rock-specimens by Mr. J. T. Prior, in the appendix, there is no reference to anything most like stratified rocks than a "pale green slate and quartz grit," of which no particulars are given. On p. 264 we read of "a huge cauldron, the bottom of which was even below the sea-level, but guarded against the waters of the cove to the west by a narrow ridge of brimstone"; but this unusual structure does not seem to have been investigated.

As to biology, birds are always referred to by their full names, generic and specific; but the seals are simply termed "Weddelli" (a name used to distinguish this seal

vague descriptions of where he went or what he saw. As he climbed a glacier on one occasion—"step by step we rose until we were a few thousand feet up, as indicated by the aneroid." This is offering a stone to the reader who hungers after definite information. The log of the crossing of the pack by the *Southern Cross* on four separate occasions might be expected to yield most important hints to the forthcoming Antarctic expeditions; but details are only given of one of these crossings. The description of the southern ice-barrier, which was dismissed in a few lines by Mr. Borchgrevink in his paper to the Royal Geographical Society, was looked forward to with the keenest interest; but in this matter we find the most tantalising reticence. The famous ice-barrier, we are told, is only from 60 to 70 feet high (about one-third of the height assigned by Ross), and at the point where a landing was made it was only 2 or 3 feet, and rose gradually southward to the normal height. There is no information as to the depth of the water alongside the barrier, a point of the most vital moment.

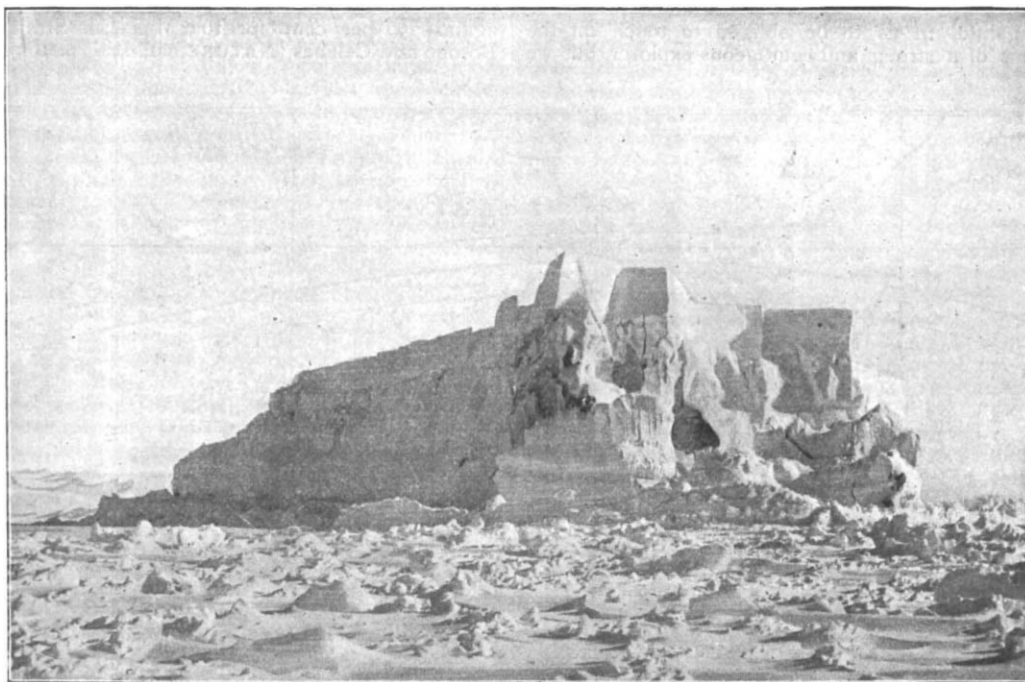


FIG. 1.—A Crystal Palace. From "First on the Antarctic Continent." By C. E. Borchgrevink.

from the sea-leopard) or "Rossii," as the case may be, without indication of their genera. Biological theory is handled thus in speaking of what is called "bi-polarity" (p. 232).

"The existence of organisms does not develop from the presence of the possibility of existence for these, but because the element necessary for the development of these organisms was brought into conditions which favoured its development into a complete organism. It seems thus that the fount whence the element of these organisms rises exists both within the Arctic and Antarctic Circles, apparently without any communication through the intermediary zones."

In dealing with geography there is an equal want of sense of proportion, definite information or clear ideas. The description of the coast of Victorialand is far less definite than Ross's. No connected account is given of the land-explorations which were carried out near Cape Adare. Mr. Borchgrevink states that he was away from his camp for so many days or weeks, but gives the

One sounding does, indeed, figure on the map, but the exact point to which it applies is not indicated. The remarkable fact that the position of the ice-barrier was found to be many miles further south than reported by Ross is not commented on. A long digression on icebergs and pack-ice is interposed in the middle of the twelve lines of description given to the part of the world where no one had ever been before. It concludes, "With a sufficient number of reindeer, sledges and dogs, and a very small party of scientific men, I believe that a great southern latitude may be reached on this ice-sheet in the proper longitude," but never a word as to what the proper longitude is.

On pp. 270-71 we read, "We secured valuable photos. of Mounts Erebus and Terror, the former being in activity;" but will it be believed that these "valuable photos" are not reproduced? This is, we confess, the most staggering circumstance about the book. Dozens of excellent pictures are given which possess absolutely no scientific value, but the one which, of all others the

geographer and geologist would like to examine has been kept back although it turned out a success.

The publication of his book will, we fear, tend to detract from the reputation which Mr. Borchgrevink has unquestionably merited by his organising power, his invincible perseverance and his successful completion of a considerable task. Had he been content to leave the discussion of matters which he did not understand to the skilled members of his staff, and had he encouraged them to discuss and describe their observations, his expedition would have redounded to his credit in scientific circles, as well as amongst lovers of adventure. We believe that the extensive collections are being examined and described by specialists in the British Museum; and we hope that the magnetic and meteorological work will also be discussed by experts and published in detail. Some results in an unredacted form are given in the appendix, the most important being Mr. Louis Bernacchi's excellent summary of the meteorological and magnetic observations, which is somewhat fuller than that published previously in the *Geographical Journal*.

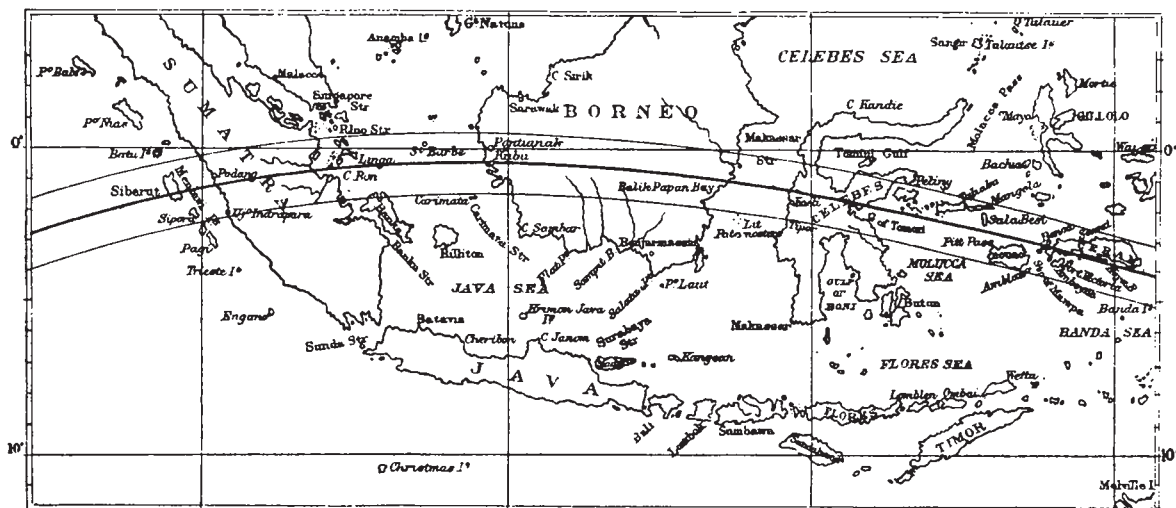
It is painful to us to be obliged to touch on the limitations of a strong and courageous explorer, but we

Guinea, and leaves the earth in long. $156^{\circ} 58' E.$, lat. $12^{\circ} 50' S.$ (See accompanying map.)

While the weather prospects at most of the possible stations of observation are, unfortunately, not of the best, there is sufficient encouragement in the meteorological statistics to hope that records of the phenomena will be secured at at least one place.

In Mauritius, in the neighbourhood of the Royal Alfred Observatory, where the duration of totality is 3m. 35s., the chances of fine weather at eclipse time are very hopeful. Mr. Claxton, the director of the Observatory, states that on only two occasions since 1874 has the sky been overcast at 9 a.m. on May 18, on sixteen occasions it has been less than half covered, and on nine occasions practically cloudless (*Journal of the Brit. Ast. Assoc.*, vol. xi. p. 121).

In the Malay Archipelago, where the maximum duration of totality on the central line is nearly $6\frac{1}{2}$ minutes, the weather prospects are not quite so good. At Padang, on the west coast of Sumatra, which is one of the most accessible and otherwise most suitable stations, the percentage clearness during May is only 28, as against 50 per cent. for the Makassar Strait between Borneo and Celebes (NATURE, vol. lxiii. p. 163).



Part of the path of the moon's shadow during the total solar eclipse of May 17-18, 1901. Reproduce from the *Nautical Almanac Circular*, No. 18.

cannot pass by without protest so striking an instance of the inability of an unscientific chief to appreciate the nature of the problems which his scientific subordinates are investigating or the results they obtain.

THE TOTAL ECLIPSE OF THE SUN, MAY 18, 1901.

THE approaching total eclipse of the sun is a notable one, not only on account of the unusually long duration of totality at the most favoured stations, but also because it occurs very near a time of minimum sun-spots. An exceptionally good opportunity of studying the corona at an important phase of the solar period is thus afforded, provided always that the sky is unclouded at the critical times.

The shadow strikes the earth a little to the south-west of Madagascar, traverses a north-easterly path across the Indian Ocean, passing over Mauritius and entering Sumatra near Padang, continues eastward across the southern part of Borneo, deviates to the south-east through the Celebes and the southern part of New

In these circumstances, it seems particularly desirable that the observers should be as widely distributed as possible, so as to diminish the risk of total failure to secure observations. This multiplication of stations, however, is rendered impracticable in this instance by the comparatively small number of astronomers at liberty to undertake the long voyage involved, and to some extent also by other causes, not among the least forcible being the undesirable presence of savage races at some places near the central line.

Arrangements have been made by the Joint Permanent Eclipse Committee of the Royal and Royal Astronomical Societies to attempt to secure observations at Padang and Mauritius. At the former station will be Mr. Newall and Mr. Dyson, who will be joined by Mr. Atkinson as a volunteer, and at the latter Mr. Maunder will work in conjunction with Mr. Claxton. While it is to be regretted that other British observers of experience do not find themselves in a position to join the expeditions, there is consolation in the fact that parties from other countries have arranged to make observations. We understand that Holland will be represented by an expedition under Dr. Nyland, of Utrecht, who will be